

## Prevalence of Pulp Stones in Libyan Subpopulation: A Panoramic Radiographic Study



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Received: 19 February 2019/ Accepted: 31 March 2019

Doi: <https://doi.org/10.54172/mjsc.v34i1.78>

**Abstract:** The aims of this study were to evaluate the prevalence of pulp stones in permanent posterior teeth of a group of adult Libyan dental patients using digital panoramic radiographs. **Materials and Methods:** Panoramic radiographs of 1200 adult patients (600 females and 600 males) were examined retrospectively to determine the prevalence and distribution of the pulp stones. All posterior teeth were investigated except third molars, and the data obtained were recorded as present or absent according to gender, tooth types, dental arches, sides and dental status (intact, restored, or carious). The Chi-square test was used for difference comparisons ( $P < 0.05$ ). **Results:** Of the 1200 patients, 363 (30.2%) had one or more teeth that contained pulp stones. Pulp stones were detected in 1402 of the 16738 teeth, to give a tooth prevalence of 8.4%. Pulp stones were discovered in 9.2% of females and 7.5% of males, with a highly significant difference between the genders ( $P < 0.0001$ ). Pulp stones were more prevalent in the maxillary arch (10.3%) than in the mandibular arch (6.5%), with a significant difference between arches. Pulp stones were most frequently occurring in right maxillary first molars (24.6%) and least occurring in left maxillary first premolars (0.1%). Pulp stones prevalence was significantly more common in the first molars than second molars, in the molars than premolars in each dental arch, and in the first maxillary molar than first mandibular molars. Pulp stones were detected more frequently in the intact teeth than in carious and restored teeth. **Conclusion:** The occurrence of pulp stones in this study was significantly higher in females than males, in maxillary teeth than in mandibular teeth, molars than premolars, first maxillary molars than mandibular molars and in intact teeth than restored and carious teeth.

**Keywords:** Panoramic radiographs; Pulp stone; Prevalence; Libyan subpopulation.

### INTRODUCTION

Pulp stones are calcified discrete masses that occur in the dental pulp. They are found in healthy, diseased, and even unerupted teeth (Arys et al., 1993; Moss and Hendricks, 1988; Sener et al., 2009; Tamse et al., 1982). Pulp stones can be found in both primary and permanent teeth (Sisman et al., 2012). Pulp stones may be observed in the coronal part of the pulp or may be even in the radicular pulp, as free, attached, or embedded calcified bodies in the dentine (Colak et al., 2012).

According to their structure, pulp stones are classified as true, false, and diffuse. The size of pulp stones range from small microscopic particles to large masses that almost obliterate the pulp chamber (Johnson et al., 1956).

The aetiology of pulp stone is not exactly known, several factors have been involved in pulp stones formation like caries, deep restoration (Goga et al., 2008), chronic Inflammation, interaction between pulp tissue

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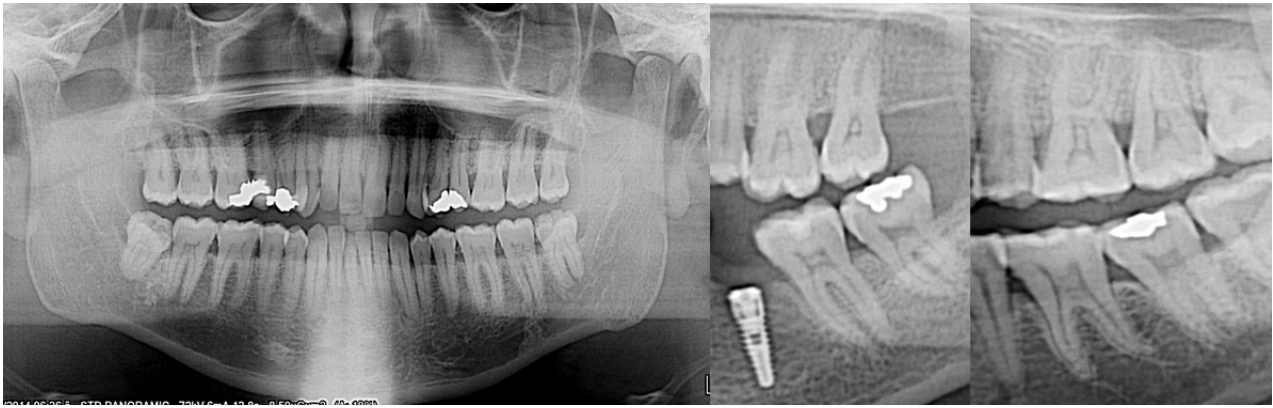
and, epithelium (Moss and Klyvert, 1983), circulatory disturbance in pulp (Sundell et al., 1968), age (Hillmann and Geurtsen., 1997), genetic predisposition (VanDenBerghe et al., 1999), and orthodontic tooth movement (Stenvik and Mjör, 1970). They are usually identified during radiographic examination as radiopaque areas of variable sizes, number, and shapes (Langeland et al., 1974). Pulp stones observed on the radiographs as a definite round or ovoid radiopacities within the coronal or radicular portion of the pulp or they may extend from the pulp chamber into the root canals.

Pulp stones occur in all tooth types but most frequently in molars (Colak et al., 2012; Goga et al., 2008; Ranjitkar et al., 2002; Sener et al., 2009; Sisman et al., 2012; Tamse et al., 1982; White and Pharoah, 2009). Previous studies reported that the prevalence of pulp stone based on radiographic examination various percentages ranging from 8–90% depending on the study type, design, and radiographic technique used (Arys et al., 1993). Histological method of evaluation is reported to yield higher values than radiographic method (Ranjitkar et al., 2002).

Pulp stones can complicate endodontic treatment by obstructing access to root canals and their subsequent cleaning and shaping (Ibarrola et al., 1997). The aims of this study were to evaluate the prevalence of pulp stones in the permanent posterior teeth of a group of adult Libyan dental patients using digital panoramic radiographs and to determine possible associations between pulp stones and gender, tooth type, dental arches, side, and dental status, also to compare the results with published data. This will provide information to the dental practitioner about the types of teeth which are more likely to reveal technical difficulties associated with the endodontic treatment of such teeth.

## MATERIALS AND METHODS

The study was granted the approval by Elaml dental center at Benghazi, Libya. In this retrospective cross-sectional study, a total of 1200 Digital panoramic radiographs (OPG) were randomly selected from the records of dental patients who attended the Elaml dental center at Benghazi, Libya for routine dental treatment. Digital panoramic radiographs were taken by using Owandy digital x-ray unit system machine (Italy). This study composed of 600 males and 600 females. A total of 16738 teeth were studied. Digital panoramic radiographs were examined by one examiner. The radiographs of children and patients with mixed dentition and Teeth with crown or bridge which will obstruct the proper evaluation of pulp were excluded. To evaluate pulp stones, radiographs were digitalized and then pulp chambers were examined by one examiner. Molars and premolars in the maxillary and mandibular arches in both sides were examined for the absence or presence of pulp stones, except for third molars. Definite radiopaque bodies observed inside the pulp chambers were described as pulp stones and were scored as present or absent according to genders in both arches, on the left and right side, and according to tooth type in both arches (Figure 1). The dental status of each tooth was categorized as intact, restored and carious. The shape, size and number of pulp stones were not evaluated. The examiner was calibrated by reading 50 of radiographs containing different cases of pulp stones before the investigation began. To check the reliability of the radiographic examination, a sample of 100 radiographs was re-examined by the same examiner two weeks later, and an agreement of 100% was obtained. Statistical analyses were performed using (SPSS 18.0, Chicago, USA) The Chi-square test was used to compare the frequency of pulp stone occurrence between genders, tooth types, dental arches and sides. Differences were considered as significant when  $P < 0.05$ .



**Figure (1):** Panoramic radiographs showing radiopaque pulp stones in the pulp chamber of molars (P<0.0001).

### RESULTS

This study consists of 1200 patients (600 females and 600 males). The distribution of patients and teeth having pulp stones according to gender is shown in (Table 1). Of the 1200 patients, 363 (30.2%) had one or more teeth that contained pulp stones, which comprised of 199 (33.2%) females and 164 (27.3%) males with a significant difference between genders P<0.05. Pulp stones were detected in 1402 of the 16738 teeth, to give a tooth prevalence of 8.4%. Pulp stones were detected in 9.2% (777/8410) of teeth in females and in 7.5% (625/8328) of teeth in males, with a highly significant difference between the genders

The distribution of pulp stone according to dental arches and genders is represented in (Table 2). Pulp stones were detected in 10.3% (847/8183) of teeth examined in the maxilla, and in 6.5% (555/8555) of teeth examined in the mandible with a significant difference between arches (P<0.05). The prevalence of pulp stones in the maxilla was higher in females 11.8% (488/4123) than in males 8.8% (359/4060). Also, its prevalence in the mandible was higher in females 6.7% (289/4287) than in males 6.2% (266/4268) with a highly significant difference between arches and genders (P<0.0001).

**Table (1):** Distribution and frequency of pulp stone according to genders.

| Pattern                     | Female (%)  | Male (%)     | Total (%)     | P     |
|-----------------------------|-------------|--------------|---------------|-------|
| Patients with pulp stone    | 199(33.2%)  | 164 (27.3%)  | 363 (30.2%)   | 0.02  |
| Patients without pulp stone | 401(66.8%)  | 436 (72.7%)  | 837 (69.8%)   |       |
| Total patients              | 600(50%)    | 600 (50%)    | 1200          |       |
| Teeth with pulp stone       | 777 (9.2%)  | 625 (7.5%)   | 1402 (8.4%)   | 0.000 |
| Teeth without pulp stone    | 7633(90.8%) | 7703 (92.5%) | 15336 (91.6%) |       |
| Total teeth                 | 8410(50.2%) | 8328 (49.8%) | 16738         |       |

**Table (2):** The distribution of pulp stone according to dental arches and genders.

| Location | Female                |                               | Male                  |                               | Total                 |                               | P      |
|----------|-----------------------|-------------------------------|-----------------------|-------------------------------|-----------------------|-------------------------------|--------|
|          | No. of teeth examined | No. of teeth with pulp stones | No. of teeth examined | No. of teeth with pulp stones | No. of teeth examined | No. of teeth with pulp stones |        |
| Maxilla  | 4123                  | 488 (11.8%)                   | 4060                  | 359 (8.8%)                    | 8183                  | 847 (10.3%)                   | 0.0001 |
| Mandible | 4287                  | 289 (6.7%)                    | 4268                  | 266 (6.2%)                    | 8555                  | 555 (6.5%)                    |        |
| Total    | 8410                  | 777 (9.2%)                    | 8328                  | 625 (7.5%)                    | 16738                 | 1402 (8.4%)                   |        |

According to the arch side, the statistic study shows that pulp stones were more prevalent on the right side 8.6% (717/ 8384) than on the left side 8.2% (685/8354). No significant difference was found between the right and the left side (P=0.4, >0.05) (Table 3).

According to tooth type, the statistic study shows that pulp stones were most frequently detected in right maxillary first molars (24.6%) and least detected in left maxillary first premolars (0.1%) (Table3).

Pulp stones were detected in 1.4% (118/8587) of the premolars, and in 15.8% (1284/8151) of the molars teeth examined. The prevalence of pulp stones in the molars was significantly higher than that in premolars (P<0.0001). The occurrence of pulp stones was higher in the first molars 19.6 % (751/3833) than in the second molars 12.3 % ( 533/4318) with a highly significant difference (P < 0.0001). The prevalence of pulp stones was higher in the second premolars 1.9 % ( 81/4192) than in the first premolars 0.8 % (37/4395) in each dental

arch with a highly significant difference (P < 0.0001) (Table 4).

The prevalence of pulp stones was higher in the maxillary molars (first molars 23.9% and second molars 15.8%) than in the mandibular molars (first molars 15.04% and second molars 8.9%) in all arch sides and both genders with highly significant difference (P < 0.0001). However, in premolar teeth, the prevalence of pulp stones was higher in the mandibular premolars (first premolars 1.4% and second Premolars 2.3%) than in the maxillary premolars (first premolars 0.2% and second premolars 1.5%) in all arch sides and both genders with a highly significant difference (P < 0.0001) (Table 5). Regarding the dental status, the teeth with pulp stones were examined for intact, restored, and carious. 618(44.1%) of intact (sound) teeth, 271(19.3%) of restored, and 513 (36.6%) of carious teeth had pulp stone (Table 6). The results are presented in figure 2.

**Table (3):** Distribution and frequency of pulp stone according to arches, sides and tooth types.

|                 | Right side            |                              | Left side             |                              | P          |
|-----------------|-----------------------|------------------------------|-----------------------|------------------------------|------------|
|                 | No. of teeth examined | No. of teeth with pulp stone | No. of teeth examined | No. of teeth with pulp stone |            |
| <b>Maxilla</b>  |                       |                              |                       |                              |            |
| First premolar  | 1041                  | 3 (0.3%)                     | 1025                  | 1 (0.1%)                     |            |
| Second premolar | 989                   | 14 (1.4%)                    | 987                   | 16 (1.6%)                    |            |
| First molar     | 972                   | 239 (24.6%)                  | 993                   | 231 (23.3%)                  |            |
| Second molar    | 1087                  | 172 (15.8%)                  | 1089                  | 171 (15.7%)                  |            |
| <b>Mandible</b> |                       |                              |                       |                              |            |
| First premolar  | 1168                  | 19 (1.6%)                    | 1161                  | 14 (1.2%)                    |            |
| Second premolar | 1113                  | 30 (2.7%)                    | 1103                  | 21 (1.9%)                    |            |
| First molar     | 963                   | 142 (15.2%)                  | 932                   | 139 (14.9%)                  |            |
| Second molar    | 1078                  | 98 (9.1%)                    | 1064                  | 92 (8.6%)                    |            |
| <b>Total</b>    | <b>8384</b>           | <b>717(8.6%)</b>             | <b>8354</b>           | <b>685 (8.2%)</b>            | <b>0.4</b> |

**Table (4):** Pulp stone distribution according to tooth type for both dental arches.

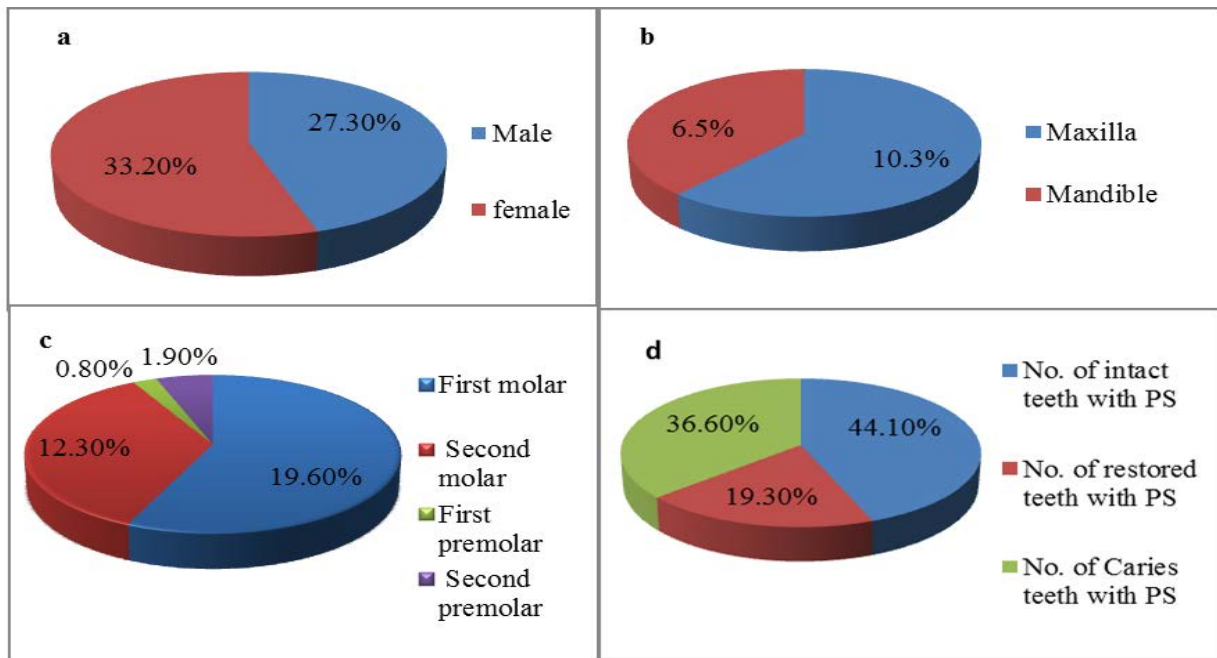
|                 | No. of teeth examined | No. of teeth with pulp stone | P     |
|-----------------|-----------------------|------------------------------|-------|
| First premolar  | 4395                  | 37 (0.8%)                    | 0.000 |
| Second premolar | 4192                  | 81(1.9%)                     |       |
| Total premolars | 8587                  | 118 (1.4%)                   |       |
| First molar     | 3833                  | 751 (19.6%)                  | 0.000 |
| Second molar    | 4318                  | 533 (12.3%)                  |       |
| Total Molars    | 8151                  | 1284 (15.8%)                 |       |

**Table (5):** The distribution of pulp stone according to dental arches, genders, and location.

| Location        | Female      |             | Male        |            | Total (%)    |
|-----------------|-------------|-------------|-------------|------------|--------------|
|                 | Right (%)   | Left (%)    | Right (%)   | Left (%)   |              |
| <b>Maxilla</b>  |             |             |             |            |              |
| First premolar  | 1(.2%)      | 1(.2%)      | 2 (0.4%)    | 0 (.0%)    | 4 (0.2%)     |
| Second premolar | 8 (1.6%)    | 8 (1.6%)    | 6 (1.2%)    | 8 (1.6%)   | 30 (1.5%)    |
| First molar     | 131(26.8%)  | 140 (27.7%) | 108 (22.4%) | 91(18.7%)  | 470 (23.9 %) |
| Second molar    | 103 (18.3%) | 96 (17.2%)  | 69 (13.1%)  | 75 (14.1%) | 343 (15.8 %) |
| <b>Mandible</b> |             |             |             |            |              |
| First premolar  | 11 (1.9%)   | 7 (1.2%)    | 8 (1.4%)    | 7 (1.2%)   | 33 (1.4%)    |
| Second premolar | 16 (2.9%)   | 10 (1.8%)   | 14 (2.5%)   | 11(2.0%)   | 51(2.3%)     |
| First molar     | 71 (15.4%)  | 67 (14.4%)  | 71 (14.9%)  | 72 (15.4%) | 281(15.04%)  |
| Second molar    | 57 (10.4%)  | 50 (9.2%)   | 41 (7.8%)   | 42 (8.0%)  | 190 (8.9%)   |

**Table (6):** Prevalence of pulp stones in teeth with different crown status.

| Number of intact teeth with pulp stone | Number of restored teeth with Pulp stone | Number of Caries teeth with pulp stone |
|--|--|--|
| 618 (44.1%)                            | 271 (19.3%)                              | 513 (36.6%)                            |



**Figure (2):** Distribution and frequency of pulp stones according to (a) Genders. (b) Arches. (c) Tooth type of both arches (d) Dental status.

## DISCUSSION

Previous studies have evaluated the prevalence of pulp stones using radiography. However, the true prevalence is likely to be higher because pulp stones with a diameter less than 200 µm cannot be detected on radiographs (Goga et al., 2008; Sener et al., 2009). To assess the prevalence of pulp stones, (Baghdady et al., 1988; Colak et al., 2012) used bitewing radiographs, (Al-Hadi Hamasha and Darwazeh, 1998; Ravanshad et al., 2015) used periapical and bitewing radiographs (Al-Ghurabi and Najm, 2012; Kalaji et al., 2017; Turkal et al., 2013) used panoramic radiographs in their study. Panoramic radiographs can show all teeth on both arches by using one radiograph, and panoramic images are excellent screening for pulpal calcifications as all teeth can be assessed using the same image (Bains et al., 2014; Nayak et al., 2010).

Furthermore, digital panoramic images may be evaluated using enhancing software that enhances detection. This study evaluated the pulp stone with a digital panoramic radiograph so that posterior teeth involved with

calcification in both the maxilla and mandible can be detected. Recently, cone-beam computed tomography (CBCT) has been used to evaluate the prevalence of pulp stones, this technique provides accurate anatomical details in three dimensions offering the possibility to view an individual tooth in axial, sagittal and coronal views (Da Silva et al., 2017; Hsieh et al., 2018; Patil et al., 2018; Rodrigues et al., 2014). The incidence of pulp stones has been reported to be from 8% to 95% in the permanent dentition (Gulsahi et al., 2009; Sisman et al., 2012; Tamse et al., 1982; Turkal et al., 2013).

The result of this study on a group of Libyan dental patients has shown an overall prevalence of 30.2% for individuals and 8.4% for all examined teeth. This prevalence was higher than the results of previous studies by (Gulsahi et al., 2009) 5% and by (Turkal et al., 2013) 2.1% in Turkish population, (Kalaji et al., 2017) 3.99% in Yemeni population, (Al-Ghurabi and Najm, 2012) 7.3% in Iraqi population and less than the studies by (Renjitker et al., 2002) 10.3% in Australian population, (Al-Hadi Hamasha and

Darwazeh,1998) 22% in Jordanians, (Baghdady et al., 1988) 14.8% in Iraqi population, (Al-Nazhan and Al-Shamrani , 1991) 10.2% in Saudi population, (Kannan et al.,2015) 15.7% in Malaysian population, (Bains et al.,2014) 9.09% in Indian population, and (Ravanshad et al.,2015) 11.25% in Iranians population. These differences in prevalence in different populations and different geographic areas may be attributed to the variation of conditions related to the studied population, such as ethnicity, dental care, and dental habits. The differences may be also due to the differences in sample size and in the methods used.

In the present study, the prevalence of occurrence of pulp stones was higher in females than males in each tooth type and both arches, and these differences were statistically highly significant ( $P < 0.0001$ ). This finding is in agreement with other studies previously reported by (Bains et al., 2014; Colak et al., 2012; Kannan et al., 2015; Ravanshad et al., 2015; Sisman et al., 2012; Tamse et al., 1982; Turkal et al., 2013). However, some studies have shown that pulp stones were more prevalent in males than in females, and other studies have reported no significant differences between genders (Al-Nazhan and Al-Shamrani, 1991; Baghdady et al., 1988; Kalaji et al., 2017; Ranjitkar et al., 2002). A possible explanation for this difference may be attributed to the bruxism which is more prevalent in females. Bruxism causes longstanding irritation on the dentition (Sener et al., 2009; Sisman et al., 2012).

The prevalence of pulp stones occurrence in this study was significantly higher in the maxillary arch than in the mandibular arch ( $P < 0.0001$ ). Pulp stones were detected in 10.3% of the examined maxillary teeth and 6.5% of mandibular examined teeth. This finding is consistent with other studies previously reported (Kalaji et al., 2017; Ranjitkar et al., 2002; Sisman et al., 2012; Turkal et al., 2013). Although in other studies,

significant differences were not detected between arches (Al-Ghurabi and Najm, 2012; Al-Hadi Hamasha and Darwazeh, 1998; Kannan et al., 2015; Patil et al., 2018).

In this study, the pulp stones were more slightly detected on the right side than on the left side, but there were no significant differences between sides ( $P=0.4, >0.05$ ). These findings were in compliance with other studies previously reported on the Turkish population (Colak et al., 2012) and the Saudi population (Patil et al., 2018). According to the findings of other studies, significant differences were detected between sides on Yemeni population (Kalaji et al., 2017) and on Turkish population (Turkal et al., 2013). However, another study by (Sisman et al., 2012) on Turkish population, and a study by (Ranjitkar et al., 2002) on Australian population reported that the prevalence of pulp stones occurrence on the left side was higher than that on the right side.

In both genders, in all dental arches and sides, the prevalence of pulp stone occurrence in molar teeth was significantly higher than that in premolar teeth ( $P < 0.0001$ ). The maxillary first molar teeth exhibited the highest occurrence of pulp stone (23.9%). This finding is in agreement with other previous studies (Ranjitkar et al., 2002; Sisman et al., 2012; Tamse et al., 1982) but according to another study, the prevalence of pulp stones occurrence is to be more in the mandibular first molar teeth (Al-Hadi Hamasha and Darwazeh, 1998).

The prevalence of pulp stones occurrence was significantly higher ( $P < 0.0001$ ) in the first molar teeth (19.6%) than in the second molar teeth (12.3 %) in all dental arches, sides, and in both genders. This finding is consistent with previous studies (Al-Hadi Hamasha and Darwazeh, 1998; Baghdady et al., 1988; Colak et al., 2012; Gulsahi et al., 2009; Kalaji et al., 2017; Kannan et al., 2015; Patil et al., 2018; Ranjitkar et al., 2002). A possible explanation of this result is that the early eruption time of

the first molar teeth will expose them to more irritants or degenerative changes, therefore, confirming that pulp calcification increases with age. Another proposed factor is that the molar teeth are the largest teeth in the dental arches, and their pulp tissues possess rich blood supply which may cause the precipitation of calcium in the pulp chamber and bear the strongest mastication forces in the arch. This may lead to greater precipitation of calcification; (Al-Ghurabi and Najm, 2012; Al-Hadi Hamasha and Darwazeh, 1998; Kalaji et al., 2017; Sisman et al., 2012).

In both genders, in all dental arches and sides, the prevalence of pulp stones occurrence in second premolar teeth was significantly higher than that in the first premolar teeth ( $P < 0.0001$ ). However, other previous studies reported that the prevalence of pulp stones is more frequent in the first premolar teeth than in second premolar teeth (Al-Ghurabi and Najm, 2012; Gulsahi et al., 2009; Sisman et al., 2012).

The incidence of pulp stones was comparatively high in the intact teeth (44.1%) when compared to the carious (36.6%) and restored teeth (19.3%), Although these findings disagree with other studies (Baghdady et al., 1988; Kannan et al., 2015; Patil et al., 2018; Ranjitkar et al., 2002; Ravanshad et al., 2015; Sener et al., 2009) that reported restored and carious teeth exhibited higher prevalence of pulp stone than intact molar teeth. Some researchers did not notice any significant differences between prevalence of pulp stones in intact or non-intact teeth (Baghdady et al., 1988; Gulsahi et al., 2009; Ravanshad et al., 2015; Tamse et al., 1982).

The exact aetiology of pulp stones formation is still unclear; many controversies exist regarding its aetiological factors. Previous studies have reported that pulp calcifications are more common in patients with cardiovascular diseases (Edds et al., 2005; Nayak et al., 2010). Another study demonstrated the association between coronary

atherosclerosis and pulp calcifications (Maranhao et al., 1987). In contrast, Horsley et al., 2009 reported that there is no significant correlation between carotid calcification and pulp stones. Clinically pulp stones have no significance other than possibly causing difficulties during endodontic treatments, such as obstructing canal location and negotiation (Gutmann, 1997).

The present study has some limitations. The limited sample size which included only adolescents and the samples were obtained from only one center. Incidence of pulp stones in anterior teeth and detailed configurations of pulp stones were not assessed in this study. Age-related changes and the relationship between systemic disorders and pulp calcifications were also not evaluated.

## CONCLUSION

The occurrence of pulp stones in this study may provide additional information regarding the dental morphological features of Libyan adults. The occurrence of pulp stones in this study was significantly higher in females than males, in maxillary teeth than in mandibular teeth, in first molars compared with other posterior teeth, first maxillary molars than mandibular molars, and in intact teeth than restored and carious teeth.

## ACKNOWLEDGMENT

The author would like to thank the Elaml dental center at Benghazi, Libya for providing the radiographs of the patients in this study.

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## انتشار حصة اللبية في عينة من الليبيين: دراسة إشعاعية بانورامية

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تاريخ الاستلام: 19 فبراير 2019 / تاريخ القبول: 31 مارس 2019

<https://doi.org/10.54172/mjsc.v34i1.78>:Doi

**المستخلص:** هدف هذه الدراسة هو تقييم مدى انتشار حصة اللبية في الأسنان الخلفية الدائمة لمجموعة من مرضى الأسنان الليبيين البالغين باستخدام صور الأشعة البانورامية الرقمية. المواد والطرق: تم فحص صور الأشعة البانورامية من 1200 مريض بالغ (600 أنثى و600 ذكر) لتحديد انتشار وتوزيع حصة اللبية. تم فحص جميع الأسنان الخلفية فيما عدا الأضراس الثالثة، وتم تسجيل البيانات التي تم الحصول عليها على أنها موجودة أو غير موجودة وفقاً للأجناس، أنواع الأسنان، فك الأسنان العلوي والسفلي، جوانب الفك وحالة الأسنان (سليمة، منخورة، أو مرممة). تم استخدام اختبار كا<sup>2</sup> لمقارنة الفروق. النتائج: من بين 1200 مريض، كان 363 (30.2%) أسنان واحدة أو أكثر تحتوي على الحصة اللبية تم اكتشاف الحصة اللبية في 1402 سن من أصل 16738 سن بنسبة 8.4%، وأظهرت النتائج انتشار الحصة اللبية في أسنان الإناث بنسبة 9.2% و 7.5% في الذكور مع فرق كبير للغاية بين الجنسين. كانت الحصة اللبية أكثر انتشاراً في الفك العلوي (10.3%) عن الفك السفلي (6.5%) مع اختلاف كبير بين الفكين. كانت الحصة اللبية أكثر انتشاراً في الأضراس الأولى في الفك العلوي الأيمن بنسبة (24.6%) وأقل نسبة في الضواحك الأولى في الفك العلوي الأيسر (0.1%). كانت نسبة انتشار الحصة اللبية أكثر شيوعاً في الأضراس الأولى من الأضراس الثانية وفي الأضراس أكثر من الضواحك في كل فك وفي الأضراس الأولى للفك العلوي أكثر من الأضراس الأولى للفك السفلي. ونسبة انتشار الحصة اللبية في الأسنان السليمة أكثر من الأسنان المنخورة والمرممة. الخلاصة: كان ظهور الحصة اللبية في هذه الدراسة أعلى بكثير في الإناث من الذكور، في أسنان الفك العلوي من أسنان الفك السفلي، الأضراس من الضواحك، الأضراس الأولى للفك العلوي من أضراس الفك السفلي والأسنان السليمة من الأسنان المنخورة والمرممة.

**الكلمات المفتاحية:** صور الأشعة البانورامية، الحصة اللبية، انتشار، الليبيون.